RELIABILITY REPORT

FOR

DG301A

PLASTIC ENCAPSULATED DEVICES

May 18, 2011

MAXIM INTEGRATED PRODUCTS

120 SAN GABRIEL DR.

SUNNYVALE, CA 94086

Approved by
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Quality Assurance
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Conclusion

The DG301A successfully meets the quality and reliability standards required of all Maxim products. In addition, Maxim's continuous reliability monitoring program ensures that all outgoing product will continue to meet Maxim's quality and reliability standards.

Table of Contents

I. Device Description

A. General

Maxim's DG300-DG303 and DG300A-DG303A CMOS dual and quad analog switches combine low power operation with fast switching times and superior DC and AC switch characteristics. On-resistance is less than 50 and is essentially constant over the analog signal range. Device specifications are ideal for battery-powered circuitry. These switches are available in a variety of formats as outlined in the *Pin Configurations* section in the full data sheet. The switch control logic inputs are fully TTL and CMOS compatible. Also featured are "break-before-make" switching and low charge injection. Maxim's DG300-DG303 and DG300A-DG303A families are electrically compatible and pin compatible with the original manufacturer's devices. All devices operate with power supplies ranging from ±5V to ±18V. Single-supply operation is implemented by connecting V- to GND.

II. Manufacturing Information

A. Description/Function:	TTL Compatible CMOS Analog Switches		
B. Process:	M6H		
C. Fabrication Location:	USA		
D. Assembly Location:	Philippines, Thailand	Philippines	Malaysia, Philippines
E. Date of Initial Production:	Pre 1997		

III. Packaging Information

A. Package Type:	14-pin CDIP	10-pin Gold Can	16-pin SOIC
B. Lead Frame:	Alloy42	N/A	Copper
C. Lead Finish:	63Sn/37Pb	AuNi	100% matte Tin
D. Die Attach:	Agglass	DA_84-1LMISR4	Conductive
E. Bondwire:	Al (1.25 mil dia.)	Al (1.25 mil dia.)	Au (1.3 mil dia.)
F. Mold Material:	Epoxy with silica filler	N/A	Epoxy with silica filler
G. Assembly Diagram:	#05-0301-0376	#05-0301-0345	#05-0301-0618
H. Flammability Rating:	Class UL94-V0	N/A	Class UL94-V0
I. Classification of Moisture Sensitivity per JEDEC standard J-STD-020-C	Level 1	Level 1	Level 1
J. Single Layer Theta Ja:	110°C/W		105°C/W
K. Single Layer Theta Jc:	14°C/W		22°C/W
L. Multi Layer Theta Ja:	N/A		70°C/W
M. Multi Layer Theta Jc:	N/A		23°C/W

IV. Die Information

A. Dimensions:	97 X 101 mils
B. Passivation:	Si_3N_4/SiO_2 (Silicon nitride/ Silicon dioxide)
C. Interconnect:	Al/1.0%Si
D. Backside Metallization:	None
E. Minimum Metal Width:	Metal1 = 0.5 / Metal2 = 0.6 / Metal3 = 0.6 microns (as drawn)
F. Minimum Metal Spacing:	Metal1 = 0.45 / Metal2 = 0.5 / Metal3 = 0.6 microns (as drawn)
G. Bondpad Dimensions:	5 mil. Sq.
H. Isolation Dielectric:	SiO_2
I. Die Separation Method:	Wafer Saw

V. Quality Assurance Information

A. Quality Assurance Contacts:	Richard Aburano (Manager, Reliability Engineering) Don Lipps (Manager, Reliability Engineering) Bryan Preeshl (Vice President of QA)
B. Outgoing Inspection Level:	0.1% for all electrical parameters guaranteed by the Datasheet. 0.1% For all Visual Defects.
C. Observed Outgoing Defect Rate:	< 50 ppm
D. Sampling Plan:	Mil-Std-105D

VI. Reliability Evaluation

A. Accelerated Life Test

The results of the 135°C biased (static) life test are shown in Table 1. Using these results, the Failure Rate (λ) is calculated as follows:

$$\lambda = \frac{1}{MTTF} = \frac{4.04}{192 \times 4340 \times 400 \times 2}$$ (Chi square value for MTTF upper limit)

(where 4340 = Temperature Acceleration factor assuming an activation energy of 0.8eV)

$\lambda = 6.1 \times 10^{-9}$

λ = 6.1 F.I.T. (60% confidence level @ 25°C)

The following failure rate represents data collected from Maxim's reliability monitor program. Maxim performs quarterly life test monitors on its processes. This data is published in the Reliability Report found at http://www.maxim-ic.com/qa/reliability/monitor. Cumulative monitor data for the M6H Process results in a FIT Rate of 0.30 @ 25C and 5.17 @ 55C (0.8 eV, 60% UCL)

B. E.S.D. and Latch-Up Testing

The AG37 die type has been found to have all pins able to withstand an HBM transient pulse of +/-400V per Mil-Std 883 Method 3015.7. Latch-Up testing has shown that this device withstands a current of +/-100mA.

Table 1
Reliability Evaluation Test Results

DG301A

TEST ITEM	TEST CONDITION	FAILURE IDENTIFICATION	SAMPLE SIZE	NUMBER OF FAILURES	COMMENTS
Static Life Test (Note 1)					
	Ta = 135°C	DC Parameters	80	1	NRKDGN004B, D/C 9911
	Biased	& functionality	80	0	XRKBAL038Q, D/C 9347
	Time = 192 hrs.		80	0	XRKEEQ001A, D/C 9350
			80	0	XRKGAC040A, D/C 9348
			80	0	XRKIEQ001B, D/C 9348

Note 1: Life Test Data may represent plastic DIP qualification lots.